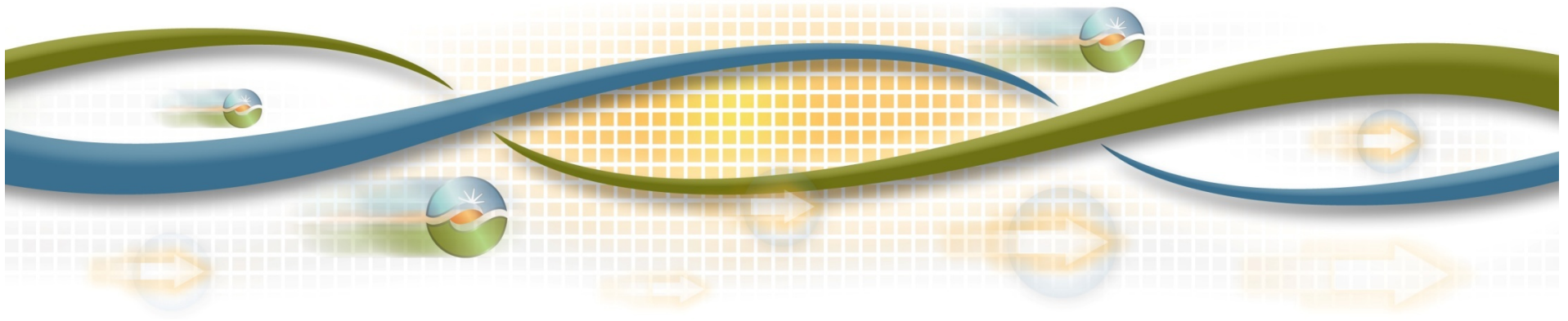




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# Summer 2012 Preparedness

June 22, 2012





## Operational Study Results for 2012:

- On a statewide and ISO system basis, supply is adequate to cover a broad range of potential peak demand conditions and contingencies.
- The absence of the San Onofre nuclear plant does not create system-wide issues but does create local reliability issues because of transmission constraints that limit imports into the Los Angeles Basin and San Diego areas.

## Reliability issues arise in the LA Basin and San Diego without the San Onofre nuclear power plant.

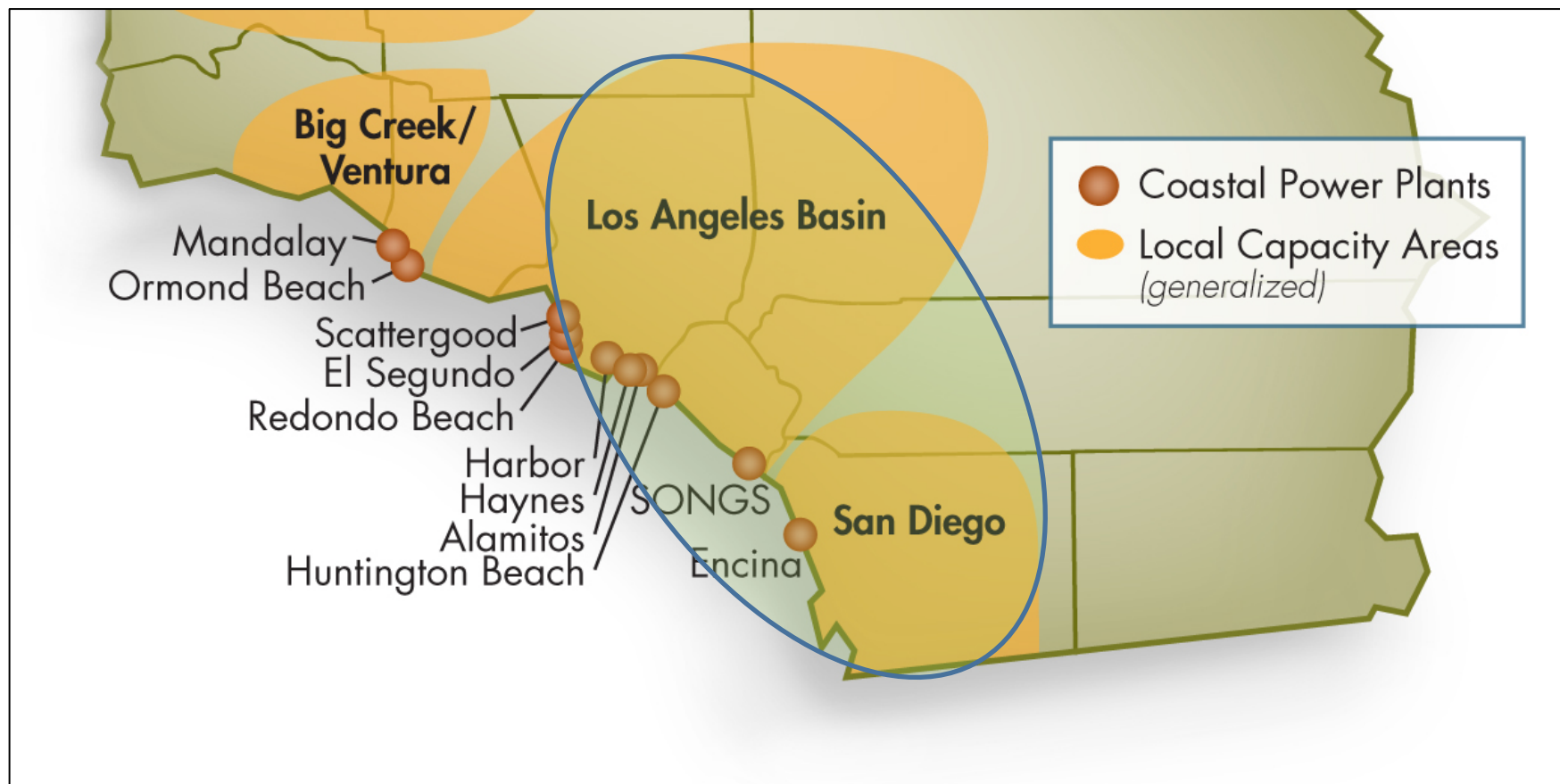
- Los Angeles Basin and San Diego areas must have local generation to serve all consumers
- The ISO already plans for the outage of one San Onofre generating unit
- ISO must plan for the major contingencies where San Diego loses eastern transmission and the largest generator



## Actions taken to mitigate the risk of outages.

- Huntington Beach units 3 & 4 returned to service
- Barre-Ellis transmission upgrade accelerated and completed
- Sunrise transmission line energized (and added safety nets in service)
- Fully funded Flex Alerts
- Fully utilize available demand response
- Sought additional military and public agency demand response
- Ensured that existing generation is well-maintained and available

## Short Term - Focus LA Basin and San Diego “Local Capacity Requirement” Areas



- Due to complementary interaction between these two LCR areas, the studies are coordinated, with San Diego LCR studies performed first. LA Basin LCR studies are performed afterward.

# Summer 2013 Contingency Planning

## Changes from 2012:

- Increased load growth
- Huntington Beach 3 & 4 expected to return to retirement
- Barre-Ellis, Sunrise, and related facilities in service
- Special protection schemes in place

All options under consideration and assessed against the following principles:

- Maintain local reliability
- Available in time
- Cost-effective
- Aligned with long-term considerations

Too soon to take options out of consideration



## A Full range of options are under consideration in looking toward the summer of 2013

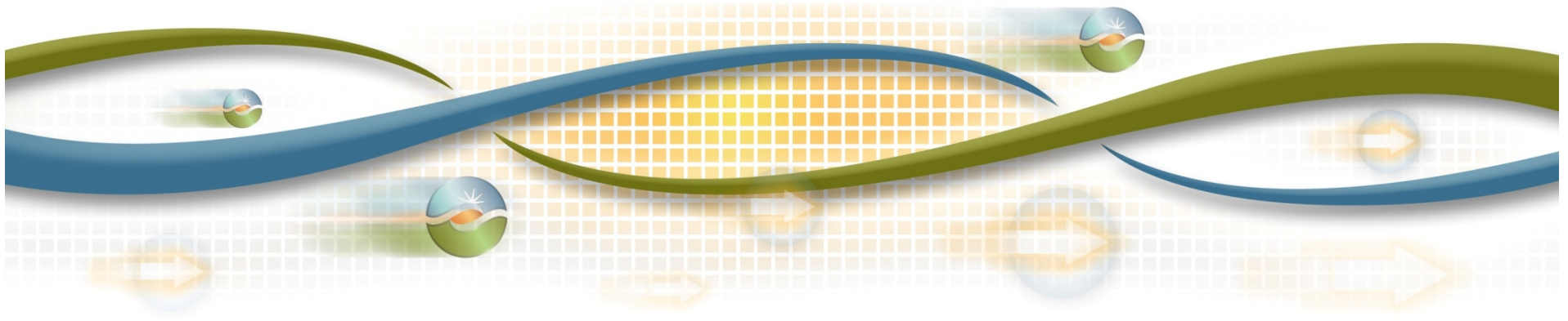
- Transmission/Dynamic Devices
  - Synchronous condensers
  - Static VAR compensators
  - Upgrades
- Operations
  - Further refinement of special protection systems
- Generation
  - Accelerating projects in development
  - Emission trades
  - Targeted distributed generation incentives
- Energy conservation investments
- Demand response enhancements



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# Long-Term Local Capacity Needs for Once Through Cooling Generation in the California ISO System

June 22, 2012

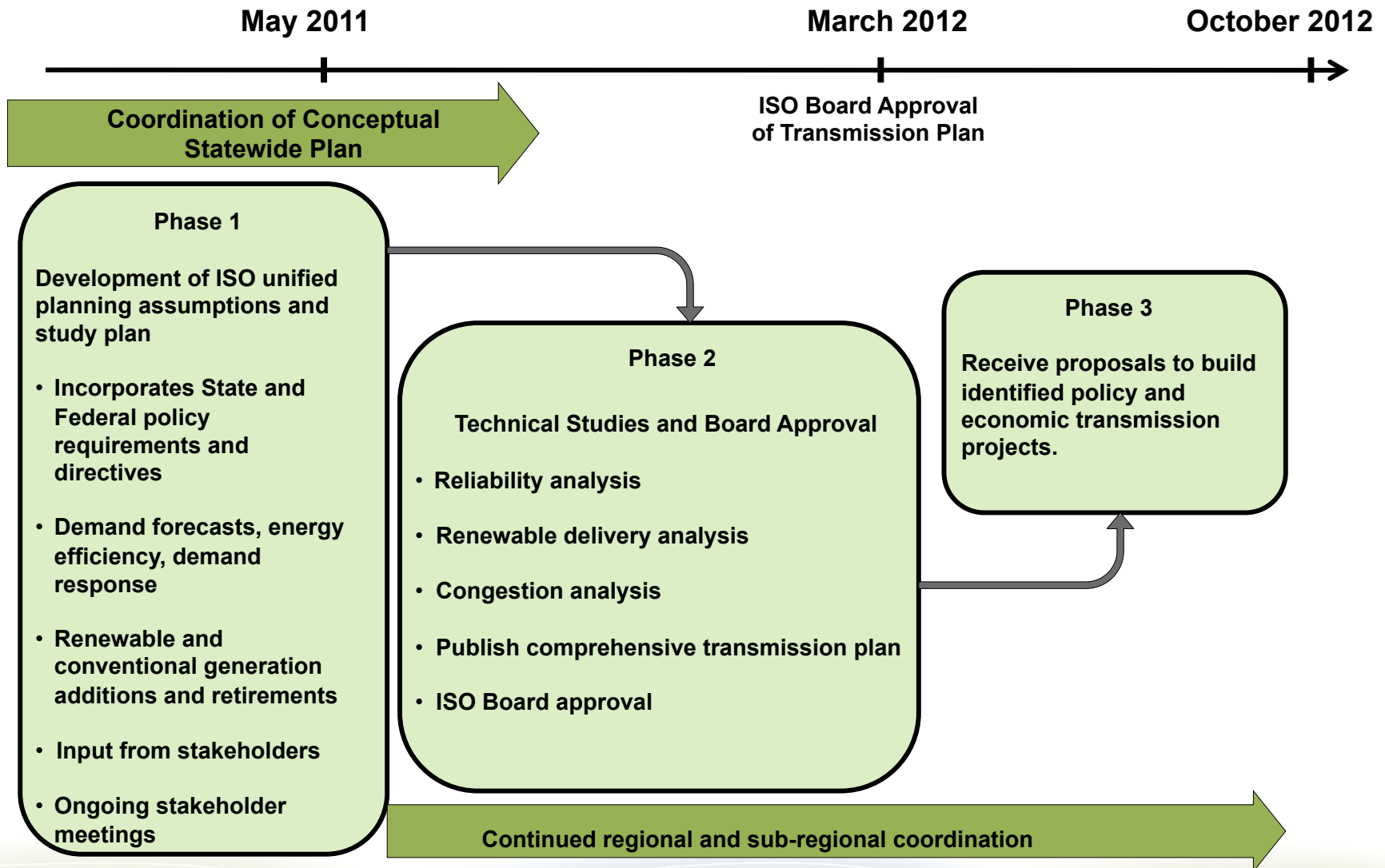




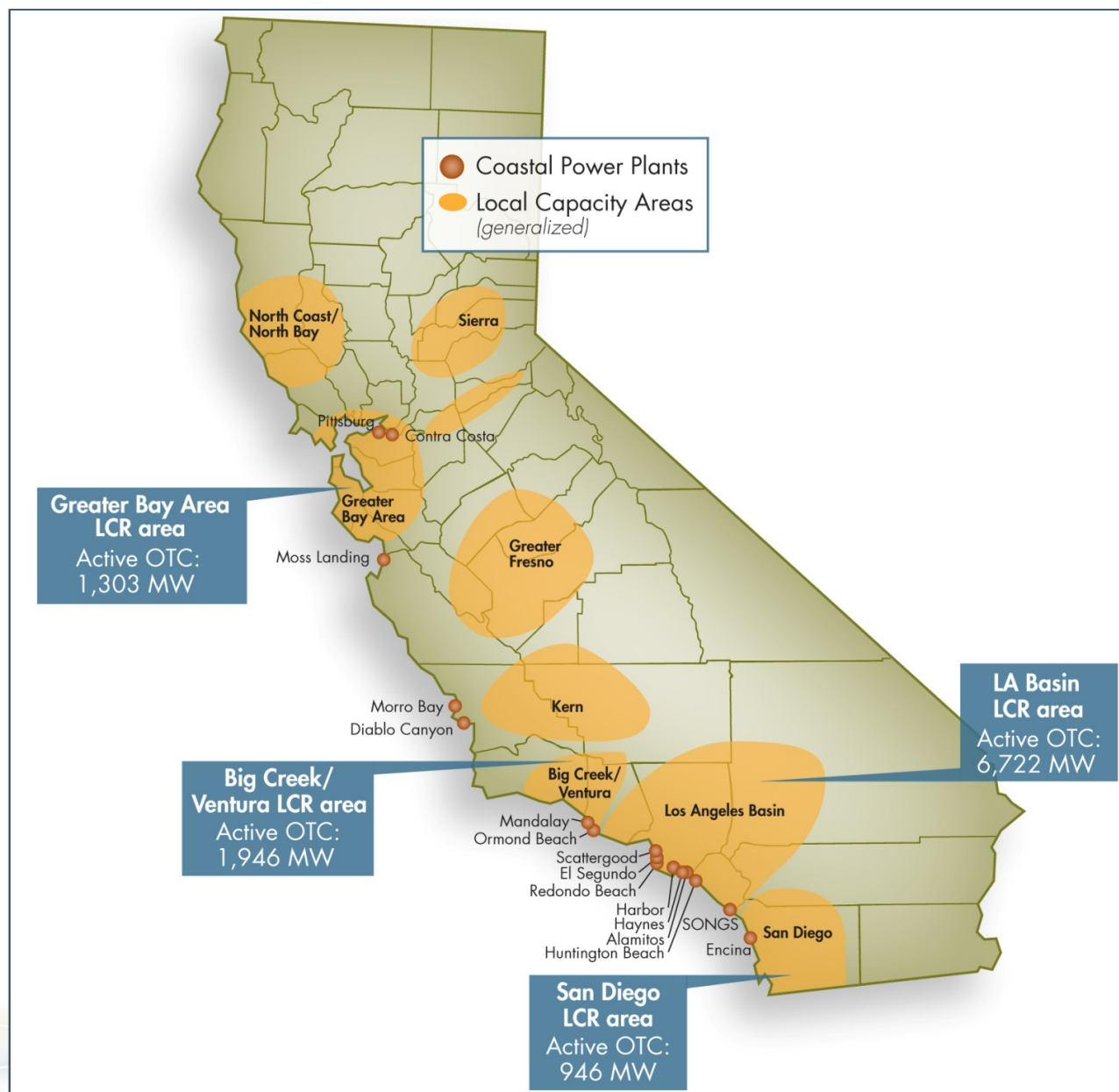
# Overview

- Background
  - 2011/12 Transmission Planning Process
  - Local Capacity Requirement Study Process
  - Overview and objectives of reliability studies
  - Summary of long-term (2021) local capacity requirement study results for once-through-cooling generation
- LA Basin study results
- Big Creek/Ventura study results
- San Diego study results
- Conclusions

# Development of 2011/2012 Transmission Plan



# ISO Local Capacity Areas and Once-Through-Cooling Plants



## Study Scope for both Once-Through-Cooling (and LA Basin Air Quality) studies

- Determine Once-Through Cooling generation levels needed to meet local area needs within ISO grid to maintain reliability for 2021 time frame.
- Study all 4 Renewable Portfolios:
  - trajectory,
  - environmentally constrained
  - time constrained
  - base (revised cost constrained) portfolio
- 2009 CEC adopted load forecast
- Utilize existing established Local Capacity Requirements methodology

## Local Capacity Requirement Study Process, Methodology and Criteria

- Year ahead study for procurement purposes
- Five-year ahead study for procurement planning
- Once-Through-Cooling generation study was a ten-year ahead study for long-term procurement planning
- 2013 Local Capacity Requirements Study Manual can be found at:  
[http://www.caiso.com/Documents/LCR\\_ManualFinal\\_2013.pdf](http://www.caiso.com/Documents/LCR_ManualFinal_2013.pdf).

# Summary of State Water Board and Generator Owners Implementation Schedule for Once-Through-Cooling Plants

Power Plant	SWRCB's Implementation Date	Generator Owner's Proposed Dates
Humboldt Bay	12/31/2010	Compliant
Potrero	One year after the effective date of policy (10/1/2011)	Compliant
South Bay	12/31/2011	Compliant
El Segundo, Harbor (LADWP), Morro Bay	12/31/2015	ES3 (7/1/2011), ES4 12/31/2017), H5 (12/31/2029), MB (12/31/2015)
Encina, Contra Costa, Pittsburg, Moss Landing	12/31/2017	E (12/31/2017), CC (4/30/2013), PTSB (12/31/2017), ML 1&2 (12/31/2032), ML 6&7 (12/31/2017)
Haynes (LADWP)	12/31/2019	Haynes 1&2 (12/31/2029), Haynes 5&6 (12/31/2013), Haynes 8, 9, 10 (12/31/2029)
Huntington Beach, Redondo, Alamitos, Mandalay, Ormond Beach, Scattergood (LADWP)	12/31/2020	HB 1&2 (12/31/2022), HB 3&4 (2012 – sold to EME to transfer emission credits to Walnut Creek Energy Center), RB 5&6 (12/31/2022), RB 7&8 (2018?), OB (12/31/2020), Scattergood 1&2 (12/31/2024), SG 3 (12/31/2015)
San Onofre Nuclear Generating Station	12/31/2022	12/31/2022
Diablo Canyon Power Plant	12/31/2024	12/31/2024



## New conventional generation

- Marsh Landing (760 MW) – repower of existing OTC Plant
- Russell City Energy Center (600 MW)
- Oakley Generating Station (624 MW)
- Lodi Energy Center (280 MW)
- GWF Tracy Combined Cycle (145 MW)
- Los Esteros Combined Cycle (140 MW)
- Mariposa Energy Project (184 MW)
- Walnut Creek Energy Center (500 MW)
- Canyon Power Plant (200 MW)
- NRG El Segundo Project (570 MW) – repower of existing OTC Plant
- Sentinel Peaker Project (850 MW)

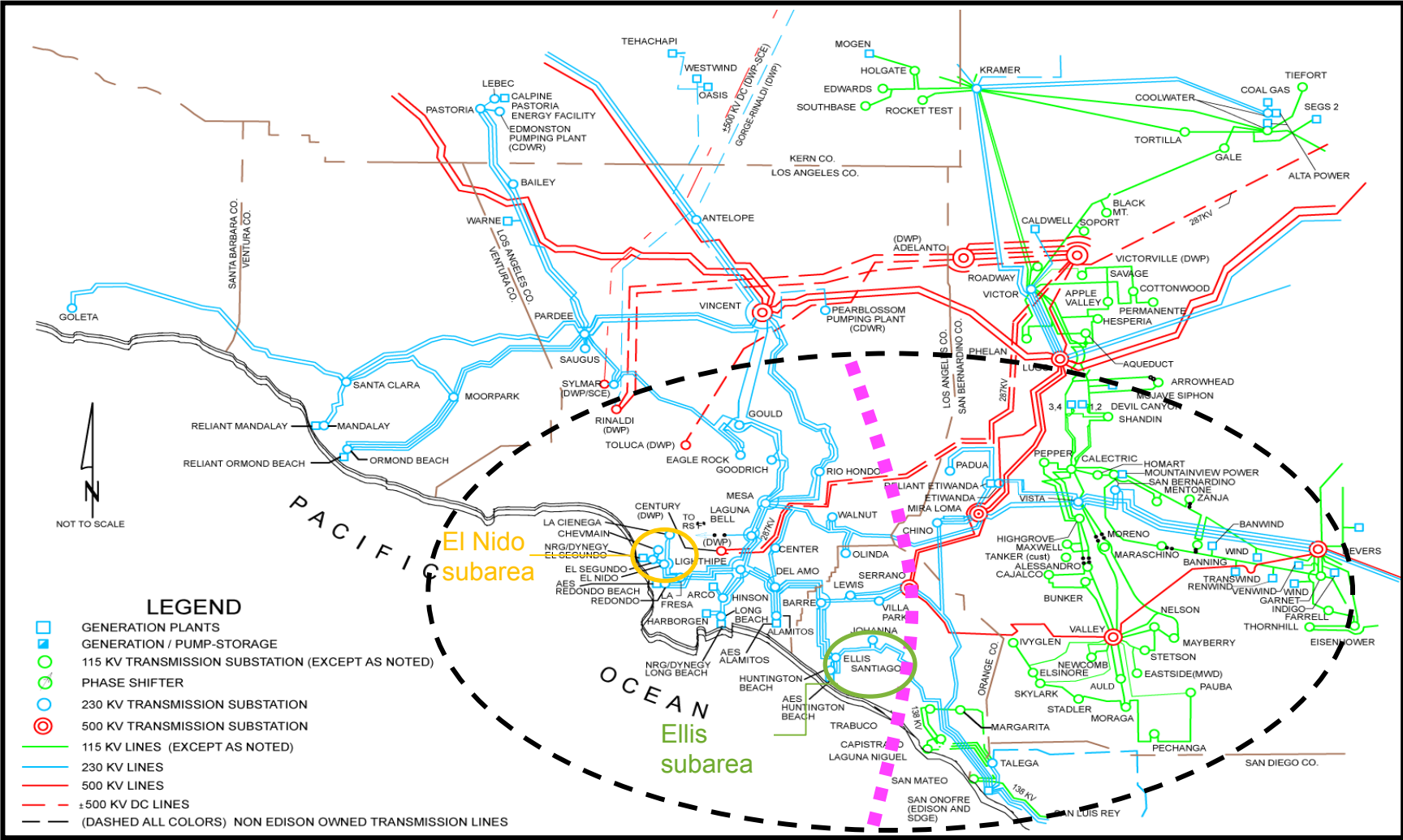
## Major New Transmission Projects

- Carrizo – Midway
- South Contra Costa
- Tehachapi transmission project
- Colorado River – Valley 500kV line
- Eldorado – Ivanpah 230kV lines
- Sunrise Powerlink
- East County (ECO) substation
- West of Devers upgrades
- Pisgah – Lugo 500kV lines
- Borden – Gregg
- Path 42 (IID – SCE) upgrades

## Local Capacity Requirement Areas with remaining needs for Once-Through-Cooling Generation (or electrical equivalent)

- Los Angeles Basin
- Big Creek/Ventura
- San Diego

## Overview of LA Basin



# LA Basin Area Long-Term (2021) Load and Resources Summary

Itemized Details	Trajectory (MW)	Environmentally Constrained (MW)	ISO Base Case (MW)	Time Constrained (MW)
<b>Total 1-in-10 Load + losses</b>	22,867	22,838	22,872	22,862
<b>Generation</b>				
Existing Net Qualifying Capacity (2012)	12,083			
Existing Once-Through-Cooling Capacity (2012)	5,166			
Distributed generation	339	1,519	271	687

# Long-Term (2021) Local Capacity Requirement and Once-Through-Cooling Generation Requirements

LCR Area	Trajectory		Environmental		ISO Base Case		Time-Constrained	
	High	Low	High	Low	High	Low	High	Low
	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)	(MW)
LA Basin	10,743	10,263	11,246	10,891	11,010	10,516	12,165	11,663
Western LA Basin	9,168	7,797	8,482	7,468	8,831	7,421	8,833	7,397
Ellis	531		597		511		556	
El Nido	619		585		568		620	
OTC	3,741	2,370	2,884	1,870	3,834	2,424	3,896	2,460

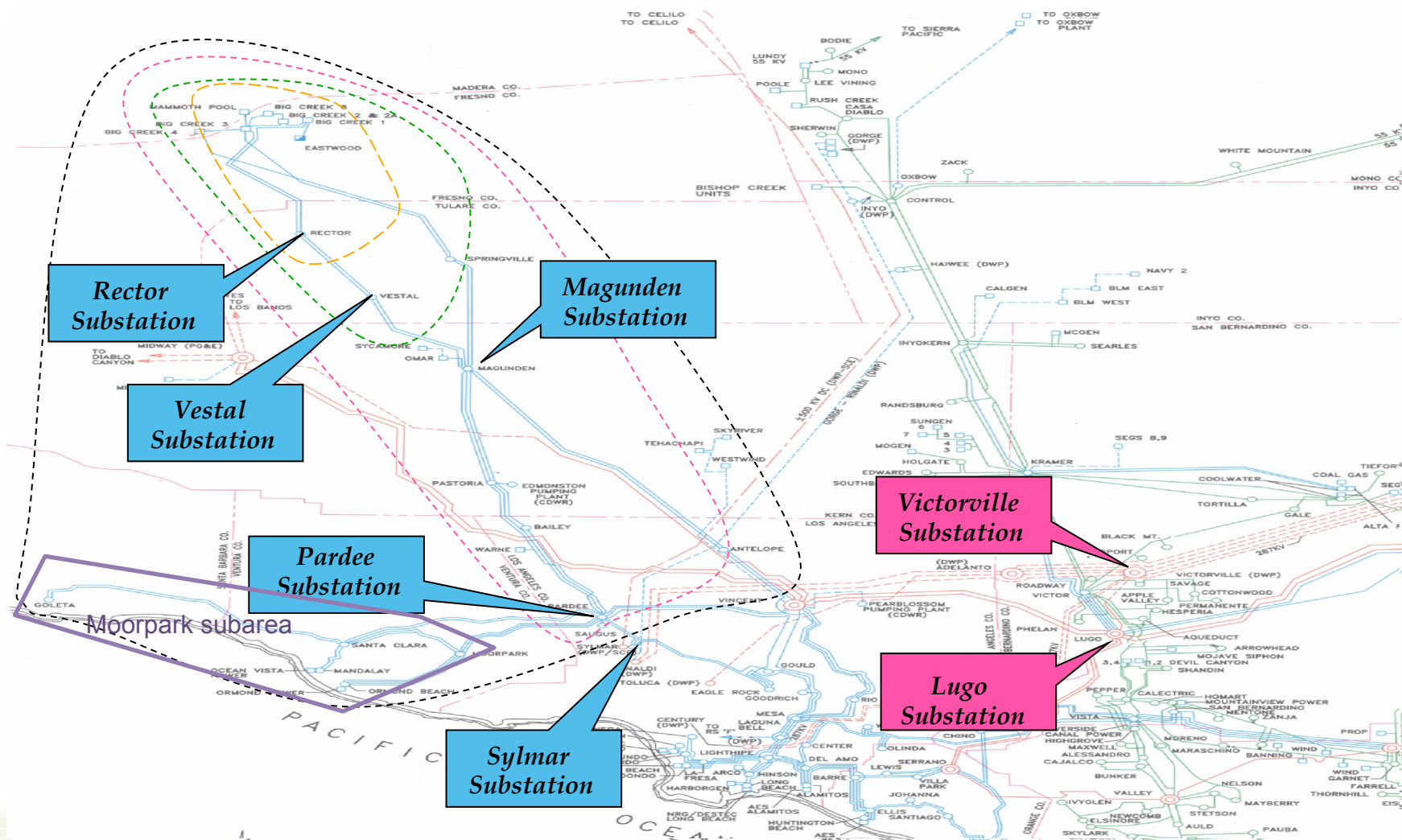
Low

High

Note: Mira Loma 500/230kV Bank #2 has a 1-Hr emergency rating that can be utilized by assuming up to 600 MW load shed/transfer after 1-Hr.



# Overview of Big Creek / Ventura



# Big Creek / Ventura Area Long-Term (2021) Load and Resources Summary

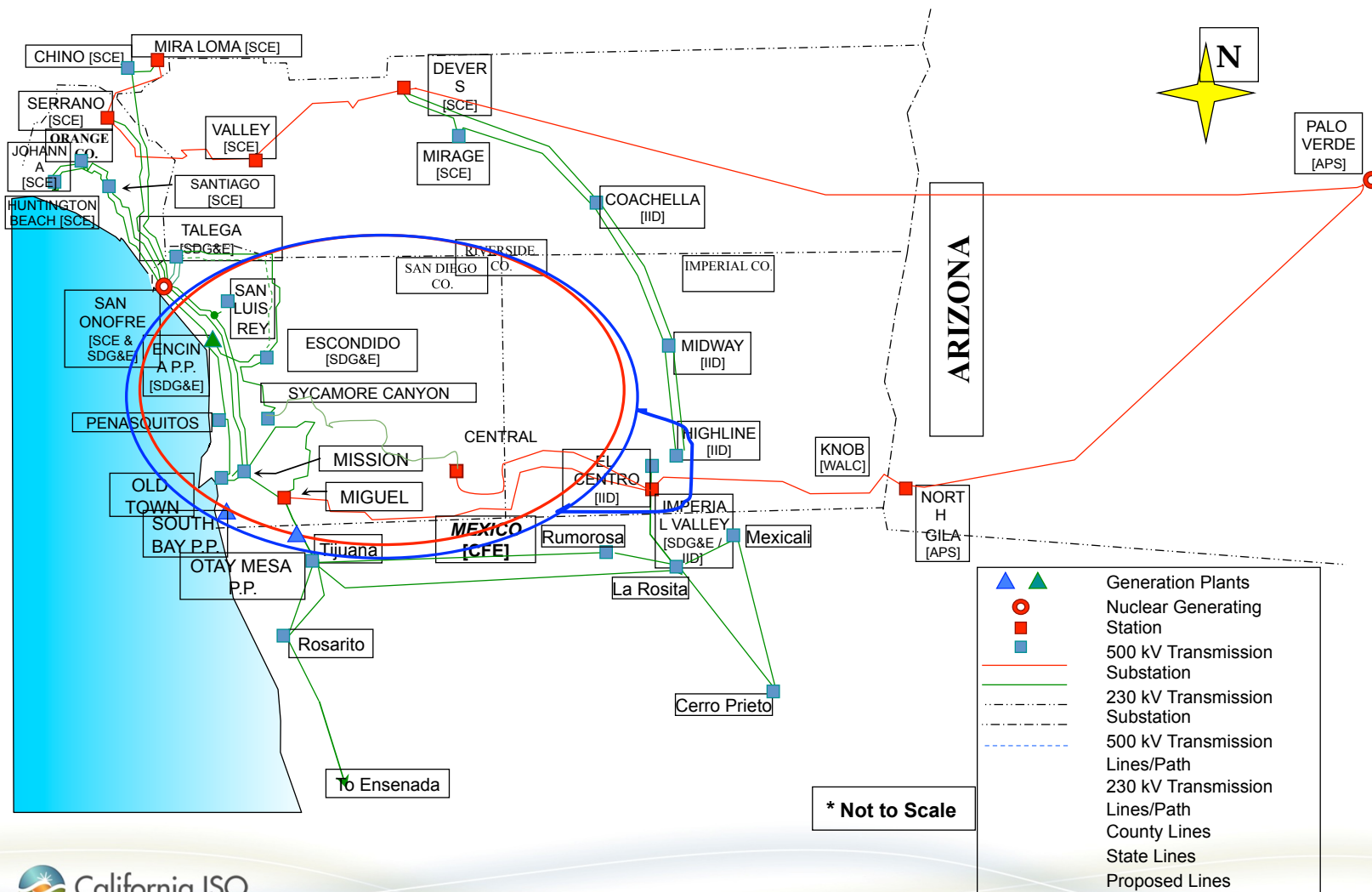
Itemized Details	Trajectory (MW)	Environmentally Constrained (MW)	ISO Base Case (MW)	Time Constrained (MW)
<b>Total 1-in-10 Load + losses</b>	4,947	4,946	4,948	4,942
<b>Generation</b>				
Existing Net Qualifying Capacity (2012)	5,232			
Existing Once-Through-Cooling Capacity (2012)	2075			
Distributed generation	4	419	61	95

## Long-Term (2021) Local Capacity Requirement and Once-Through-Cooling Generation Requirements

LCR Area	Trajectory (MW)	Environmental (MW)	ISO Base Case (MW)	Time- Constrained (MW)
Big Creek / Ventura	2,371	2,604	2,794	2,653
Moorpark	735	642/857	651	673/803
Rector	474	597	511	556
Vestal	638	585	568	620
OTC	430	430	430	430

OTC Requirement unchanged

# San Diego LCR Area



# San Diego Area Load and Resources Summary

Itemized Details	Trajectory (MW)	Environmentally Constrained (MW)	ISO Base Case (MW)	Time Constrained (MW)
<b>Total 1-in-10 Load + losses</b>	5,745	5,751	5,745	5,741
<b>Generation</b>				
Existing Net Qualifying Capacity (2012)	3,049 Cabrillo 2 units are included in this number but were not modeled in the base cases used in the analysis.			
Existing Once-Through-Cooling Capacity (2012)	950			
Distributed generation	52	402	104	81
SDG&E Non-Simultaneous Import Capability (for SDG&E only)	3,500	3,500	3,500	3,500

# Long-Term (2021) Local Capacity Requirement and Once-Through-Cooling Generation Requirements

LCR Area	Trajectory (MW)	Environmental Constrained (MW)	ISO Base Case (MW)	Time Constrained (MW)
San Diego	2,646	2,524	2,663	2,553
IV – San Diego	3,291	3,104	2,968	3,272
OTC Range*	311* - 730	0* - 300	211* - 630	121* - 540

High

Low

\* Lower values correspond to the use of SDG&E-proposed generation included in Long Term Procurement Plan



## Additional San Diego Analysis - Needs were also assessed to:

- Identify transmission upgrades to support full deliverability of the renewable resources and Target MIC
  - Maintain deliverability of the Target Maximum Import Capability
  - Maintain 1500 MW total import from IID
  - Maintain deliverability of renewable resources inside CAISO BAA
- Test sub-area constraints inside San Diego area.
- Test sensitivity of retirement of Encina plant

## Summary of Additional San Diego Studies

- Sub-area constraints are largely eliminated by approved transmission projects
- Additional upgrades identified in Encina retirement sensitivity study are caused by the combination of the retirement of Encina and addition of new Pio Pico, Quail Brush and Escondido Energy Center resources
  - Replacing the Encina generation with similarly located generation eliminates the need for the additional upgrades.

## Conclusions - Long-Term Local Capacity Needs

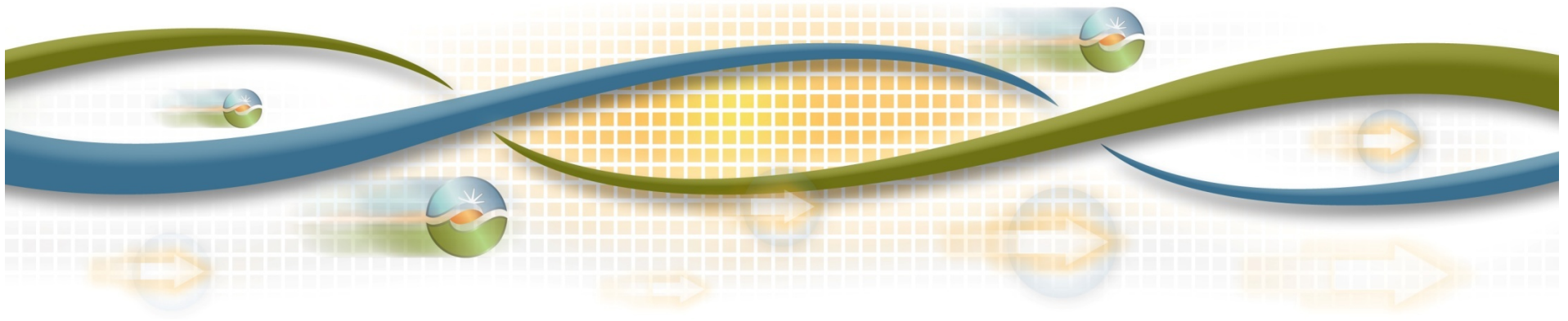
- These assessments were performed to determine capacity needs to maintain local reliability.
- Local generation capacity will continue to be required at the existing Once-Through-Cooling generation power plant locations (or electrically equivalent locations), in the LA Basin, Big Creek/Ventura, and San Diego



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# Longer Term Planning Efforts regarding Nuclear Generation

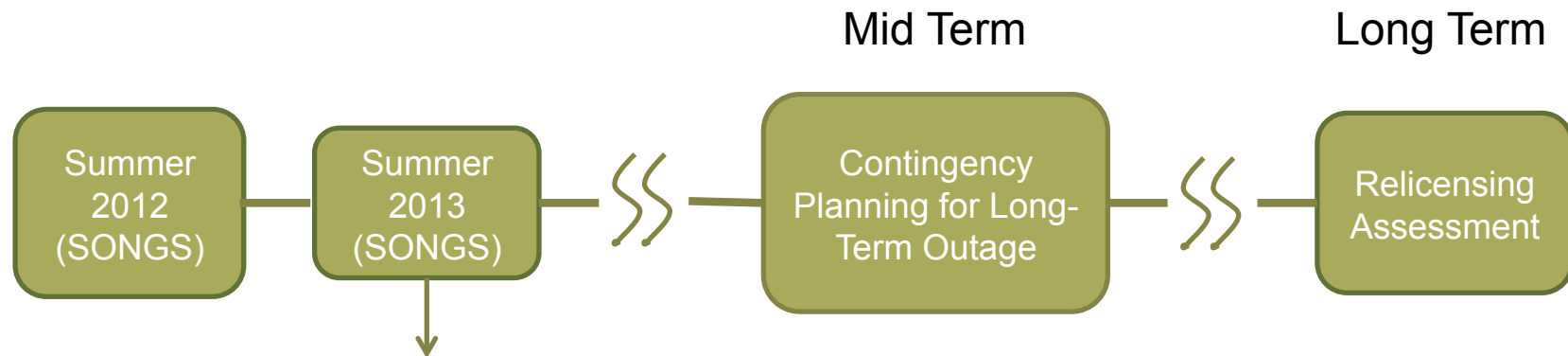
June 22, 2012



# Diablo Canyon (DCPP) and San Onofre (SONGS)



# Longer Term Study Efforts Underway



2013 plan by end of July 2012

“Least regrets” approach:

- Maintain reliability

- Timely

- Doesn't foreclose future alternatives

- Consistent with longer-term needs



# Long Term Study - Relicensing Assessment

## Diablo Canyon (DCPP)

- Assess resource implications for northern CA and ISO overall
- Assess reliability impact for:
  - Key central transmission paths
  - Helms pumping capabilities
  - Western Interconnection critical outages (PDCI bipole outage, etc.)

## San Onofre (SONGS)

- Assess resource implications for southern CA and ISO overall
- Assess reliability impact for:
  - Key central CA transmission paths
  - LA Basin\*
  - San Diego \*
  - Western Interconnection critical outages (PDCI bipole outage, etc.)

\* Preliminary long term SONGS-related Los Angeles/San Diego analysis is being conducted to aid in developing the long term plan study scope.

## Mid Term Study - Contingency Planning for Unplanned Long-Term Outages

- Addresses IEPR request from CEC
- “Backing up” from Long Term Plan
- Studies to be conducted as part of the long term plan development
- Incorporate once-through cooling policy implications
- Considers the long term plan

# Anticipated Study Results

## Long Term Study – Relicensing Assessment

- Implications for major transmission and generation additions
- Focusing on long term and robust solutions

## Mid Term Study – Contingency Planning

- Considers what elements of the long term plan should be initiated immediately to help mitigate future unplanned extended outages

Long and Mid-Term Study Results targeted for end of 2012

Summer 2013 Results targeted for end of July